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9297-68  
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NRO REVIEW COMPLETED

8 October 1968

MEMORANDUM FOR: Director of Operations, OSA  
ATTENTION : Special Action Staff, OSA  
SUBJECT : Quarterly Program Progress Report  
Deputy for Research and Development  
(July, August, September 1968)

Attached is the Deputy for Research and Development,  
OSA Quarterly Program Progress Report for the quarter  
ending 30 September 1968.

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Deputy for  
Research and Development  
Special Activities

Attachment:  
Quarterly Program  
Progress Report

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3 - D/R&D/OSA(Chrono)  
4 - RB/OSA

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QUARTERLY PROGRAM PROGRESS REPORT

Deputy for Research and Development

July, August, September 1968

**I. OXCART**

**A. Life Support**

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25X1A During 11-12 July a meeting was held [redacted] to determine distribution of OXCART life support assets. Items were identified for storage as part of the 5/90 kit, for loan from the 5/90 kit to [redacted] or for permanent transfer to [redacted] 25X1A [redacted] Appropriate depots have taken action to comply with these requirements.

**II. IDEALIST**

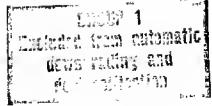
**A. U-2R Development Summary**

1. Airframe - A U-2R technical meeting was held at LAC, Burbank, to review the status of significant problems affecting the U-2R progress as well as the status of the aircraft performance as affected by excessive weight and drag and engine thrust deficiencies. A detailed report (IDEA-0746-68) has been written summarizing the significant results of this meeting.
2. Propulsion - Operation of a J75 engine on the East Hartford test stand resulted in the development of an orifice in the main oil pump to boost pump pressure sense line which dampens the interaction between the two pumps and apparently caused the oil pressure fluctuations. Two of these orifices have been utilized in installed engines on a trial basis. More than 56 flight hours have been accumulated to date with no report of oil pressure fluctuations.

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25X1A

Attachment to  
 [redacted] 9297-68  
 Page 2

25X1A  
25X1A

3. Life Support - [redacted]  
 [redacted] received partial pressure suit/altitude chamber indoctrinations at the Castle AFB physiological training unit during the period 15-18 July.

U-2R Life Support System

a. S-1010 PPA Fittings/Altitude Chamber Indoctrinations - The following individuals were fitted and given indoctrination:

25X1A

[redacted] 28-30 July 1968  
 19-23 Aug 1968  
 19-23 Aug 1968  
 23-25 Sept 1968

b. Parasail Evaluations - The S-1010 PPA/U-2R Seat Kit were evaluated with respect to their protective and safety features related to parachute descent, water entry, parachute canopy release and suit flotation during parasail evaluations conducted at Lake Mead, Nevada, during 8-10 July 1968. Results were very satisfactory.

c. U-2R Air Conditioning - A meeting was held on 6 August 1968 to review and discuss the U-2R air conditioning system deficiencies, modifications and test data. The deficiencies have been apparently resolved by the latest modifications and no further problems are anticipated.

d. Underwater Escape Evaluations - An evaluation program was conducted at Miramar NAS, San Diego, California, on 7-8 August 1968 to evaluate and develop procedures for emergency egress from a submerged U-2R cockpit, to evaluate the S-1010 PPA and U-2R seat kit under submerged conditions, and to evaluate the training value of such an exercise for project pilots involved in U-2R carrier operations. Specific escape procedures were developed and U-2R life support equipment proved to provide excellent protection under such emergency conditions. A training program will be established for all personnel involved.

25X1A

25X1A

Attachment to  
[redacted] 9297-68  
Page 3

e. S-1010 PPA Refit and Evaluation Program - A series of problems regarding comfort and possible safety of the S-1010 PPA were brought out during July and August 1968 by the Detachment G commander. A meeting was held at Detachment G on 5 August 1968 to outline a course of action to resolve such problems. A suit refitting effort was undertaken by Detachment G life support personnel, followed by cockpit and/or in-flight evaluations. These efforts did not yield completely satisfactory results, so additional efforts and evaluations were conducted during the period 26-30 August 1968. All project pilots, [redacted] now have completely safe assemblies and the majority of comfort problems have also been resolved.

25X1A

f. Developmental Efforts - The David Clark Company is presently working on the development of several modifications/changes to the S-1010 PPA to improve comfort, reliability, safety and ease of maintenance. Included are the following:

- (1) Incorporation of a full-size sunshade.
- (2) Improved helmet microphone mounting.
- (3) New antisuffocation valve which can be manually closed.
- (4) Methods for reducing lateral torque of neck ring subassembly.
- (5) Insulation pads for suit vent system for protection from frostbite due to aircraft air conditioning modifications.

4. Payload - Flight verification tests were conducted during this period with A-1 and A-2 camera systems as well as with the H camera, B-1 and B-2 cameras, DELTA III and T-35 tracker. The [redacted] borrowed from

25X1A

[redacted] USAF assets has been flight demonstrated in the U-2R. An "H" hatch was used to confirm compatibility requirements and design characteristics for the [redacted] scheduled for delivery in December 1968. Camera production

25X1A

25X1A

Attachment to  
[redacted] 9297-68  
Page 4

25X1A

is on schedule. Flight tests conducted under high humidity conditions at McCoy AFB with a B-2 configuration yielded satisfactory results.

III. GENERAL R&D

A. Drag Reduction Program - The wind tunnel program has demonstrated clear gains in drag reduction and the necessity for an appropriate analytical model to provide specific design criteria for the diffusers to obtain further drag reductions. Development of the analytical model is underway.

The DD/S&T, D/NRO, Dr. Jones and Dr. Allen of NASA, Ames, and LAC personnel were all briefed on the drag reduction program. NASA will schedule wind tunnel test time during the next quarter to test a larger scale model at higher Reynolds numbers and Mach numbers.

B.

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C. Propulsion - High Altitude Engine Relight Program - A program has been initiated with Pratt & Whitney and Lockheed to develop a system for improving the altitude relight envelope of the J75-P-13B engine in the U-2R aircraft through use of oxygen injection. The program at Pratt & Whitney is progressing on schedule. All hardware is to be delivered by early October with engine endurance testing beginning two weeks after delivery of hardware. A fuel control

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25X1A

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Attachment to  
[redacted] 9297-68  
Page 3

25X1A

has been modified by [redacted] and bench tests began in September. Some delay may occur in the scheduled date for delivery of hardware to Lockheed due to an aircraft interference problem with some of the oxygen supply lines. The date of delivery of hardware to Lockheed will be revised when the interference problem has been resolved. The target date for resolution of this interference problem has been set for 1 October.

25X1A

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D. Haze Attenuation Study - During September four flight tests were conducted at Albuquerque, New Mexico with SO121, SO230, and 3400 films using various combinations of polarizing and haze filters. Results of these tests will be analyzed by NPIIC to determine the value of the polarizing filter for operational use.

IV. MISCELLANEOUS

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A. Methane Fuel Technology - A briefing by [redacted] and [redacted] of R&D was held with Mr. Joe Jones (Assistant Secretary of the Air Force for R&D) on

25X1A

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Attachment to  
[redacted] 9297-68  
Page 6

25X1A

13 September 1968 on methane fuel technology for airbreathing engines. The program which R&D had originally proposed to NRO for FY-68 and FY-69 was reviewed with Mr. Jones. This involved a four phase effort leading up to test operation of a complete engine using methane fuel. Mr. Jones indicated interest in NRO fundings of a limited portion of this effort. After a visit by PSD to P&W (FRDC) during October for an updating of the overall P&W Methane effort, a briefing will be assembled for presentation to NRO by OSA, outlining a proposed program.

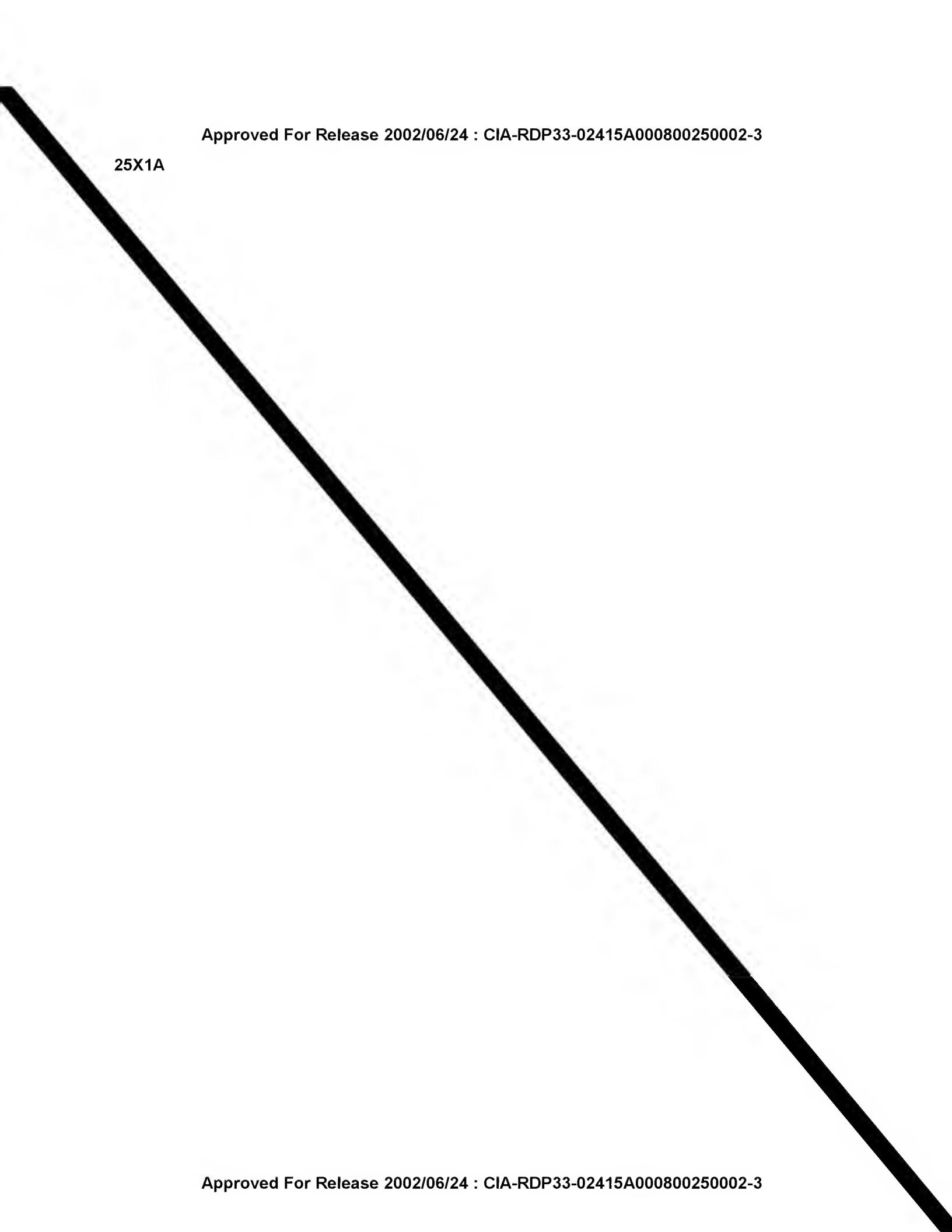
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